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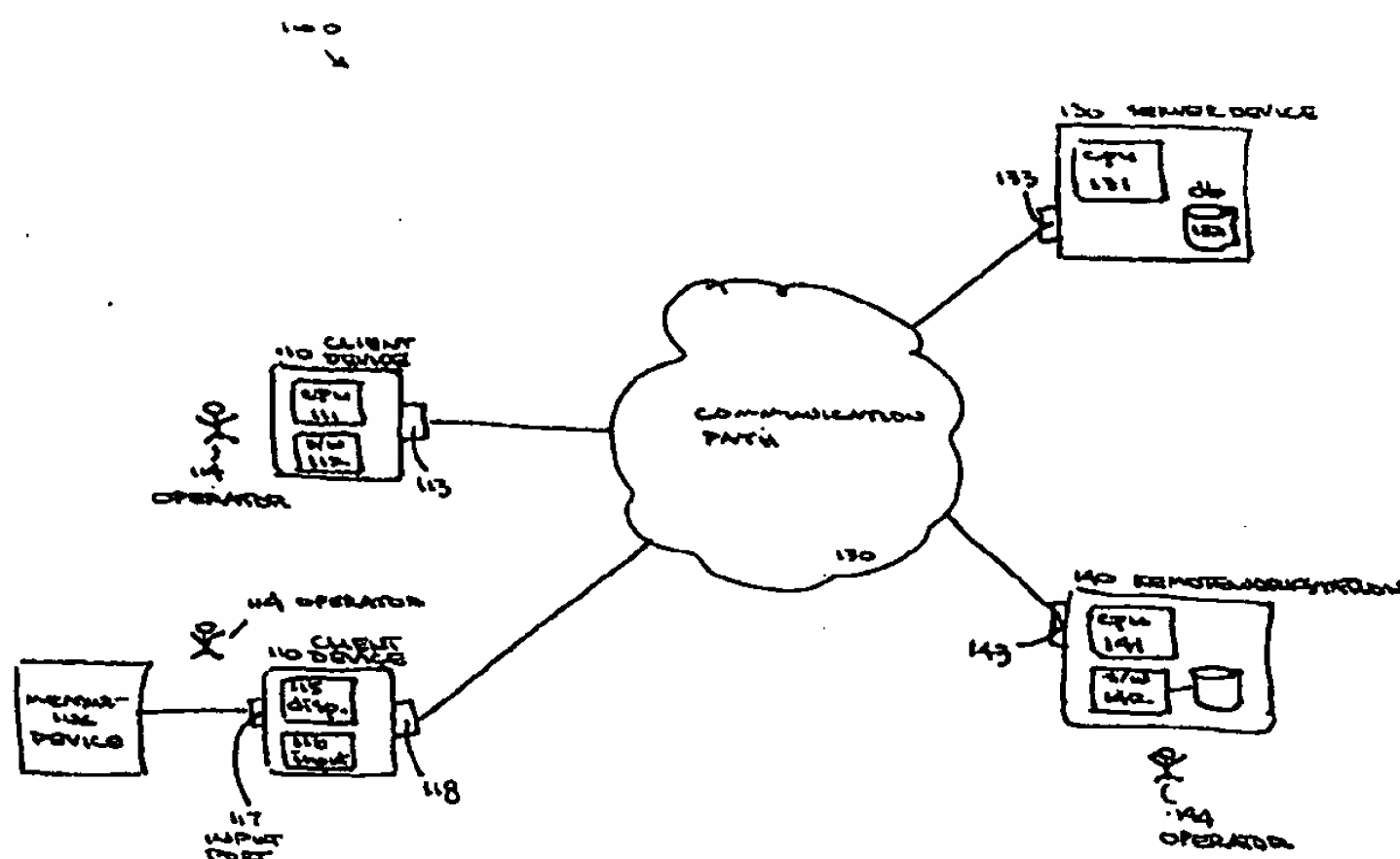
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(54) Title: AGGREGATING AND POOLING INFORMATION IN A COMMUNICATION SYSTEM WITH FEEDBACK**(57) Abstract**

The invention provides a method and system for aggregating and pooling information with feedback in a computer communication system. A communication system includes a server device and a set of client devices. Each client device collects information from an associated individual (whether by asking questions of those individuals, or accepting data input from peripheral devices), and transmits that data to a server device. The server device, or some other device at its behest, determines statistical information with regard to that data (such as aggregate, correlation, dispersion, or other measures), and provides that information to a communication channel for distribution to the individuals. The communication channel can include either (1) a broadcast communication channel that members of an affinity group can display, or (2) redistributing the determined statistical measures to associated individuals using the client devices. The statistical measure (such as an aggregate or sum) can be computed and distributed for the entire population, or can be computed and compared for selected sub-populations as a contest.

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Title of the Invention

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11 Aggregating and Pooling Information in a Communication System with Feedback

12

13

Background of the Invention

14

15 1. *Field of the Invention*

16

17 This invention relates to aggregating and pooling information.

18

19 2. *Related Art*

20

21 In programs that have a number of participants, it sometimes is desirable to
22 aggregate information from those participants, so as to indicate to individuals in a popu-

1 lation when the population (or a subset of that population) is achieving a selected goal.
2 For example, in fund-raising events for an affinity group, it is often desirable to publicize
3 to the individuals the progress of the fund-raising event toward a selected goal. Similarly,
4 in an affinity group such as a weight-loss club, it would be advantageous to be able to
5 publicize the collective results of the efforts of individuals in the affinity group. -

6

7 One problem in the known art is that of collecting information from diverse
8 sources, aggregating that information, and presenting that information to the individual
9 members of the population. This problem is particularly exacerbated if the information to
10 be collected is not available in any single location, and is further exacerbated if the indi-
11 viduals to receive the information to be publicized are not available in any single location.

12

13 The known art includes methods for aggregating and pooling information
14 for bidding or otherwise conducting auctions using distributed communication systems.
15 Some of these known methods include systems described as known art in the following
16 applications:

17

18 o U.S. Application Serial No. 09/092,604, "Method for Conducting an On-Line Bid-
19 ding Session with Bid Pooling," filed June 5, 1998, in the name of the same in-
20 ventor, and assigned to the same assignee;

21

22 and

1 o U.S. Application Serial No. 08/603,131, filed February 20, 1996, issued on August
2 11, 1998, as U.S. Patent 5,794,219, in the name of the same inventor, and assigned
3 to the same assignee.

4
5 These applications are hereby incorporated by reference as if fully set forth
6 herein, and are collectively referred to herein as the "On-Line Bidding Disclosures." Al-
7 though these applications describe other known art, no admission is made herein that any
8 part of these applications are themselves known in the art.

9
10 In the On-Line Bidding Disclosures, individual users, coupled to a system
11 using a communication network, are able to enter values into their client devices. The
12 individual values are collected at a server device or other data clearinghouse. The indi-
13 vidual values are aggregated or pooled. The aggregated or pooled information is used to
14 determine whether the individual users, either individually or in sub-populations, are win-
15 ners of the on-line auction.

16
17 Accordingly, it would also be advantageous to aggregate or pool informa-
18 tion (whether medical, financial, or otherwise) so that the collective information could be
19 publicized to participating individuals. This would be particularly advantageous in en-
20 couraging members of an affinity group to promote their individual efforts so as to cause
21 the collective affinity group to achieve a selected goal, or in encouraging sub-populations
22 of a population to promote their individual efforts so as to cause the collective efforts of

1 each sub-population to match or exceed other sub-populations. These advantages are
2 achieved in embodiments of the invention in which each individual uses a client device to
3 enter values (either over a period of time, or in response to a prompt by the client device),
4 and in which the aggregated or pooled information is presented by means of a broadcast
5 medium or other communication technique. For example, members of a weight-loss club
6 can aggregate their individual weight-loss each day, so that the aggregated results can be
7 announced on a popular television show or displayed at their client devices.

8

9

Summary of the Invention

10

11 The invention provides a method and system for aggregating and pooling
12 information with feedback in a computer communication system. A communication sys-
13 tem includes a server device and a set of client devices. Each client device collects in-
14 formation from an associated individual (whether by asking questions of those individu-
15 als, or accepting data input from peripheral devices), and transmits that data to a server
16 device. The server device, or some other device at its behest, determines statistical in-
17 formation with regard to that data (such as aggregate, correlation, dispersion, or other
18 measures), and provides that information to a communication channel for distribution to
19 the individuals.

20

21 In a first preferred embodiment, the communication channel includes a
22 broadcast communication channel that members of an affinity group can display. In a

1 second preferred embodiment, the communication channel includes redistributing the de-
2 termined statistical measures to associated individuals using the client devices. In a first
3 aspect, the invention includes distributing the computed statistical measure (such as an
4 aggregate or sum) for the entire population. For example, the first aspect would include
5 announcing a total weight-loss for a weight-loss club on a television show. In a second
6 aspect, the invention includes comparing the computed statistical measure for a first sub-
7 population against a similar statistical measure for a second sub-population. For example,
8 the second aspect would include comparing total weight-loss for selected teams and
9 awarding a prize or other benefit to the team with the best result.

10

11

Brief Description of the Drawings

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Detailed Description of the Preferred Embodiment

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22

In the following description, a preferred embodiment of the invention is de-
scribed with regard to preferred process steps and data structures. Embodiments of the

1 invention can be implemented using general purpose processors or special purpose proc-
2 essors operating under program control, or other circuits, adapted to particular process
3 steps and data structures described herein. Implementation of the process steps and data
4 structures described herein would not require undue experimentation or further invention.

5

6 *Related Applications*

7

8 Inventions described herein can be used in combination or conjunction with
9 inventions described in the following patent application(s):

10

11 o Application Serial No. _____, Express Mail Mailing No. EE261914722US,
12 filed September 23, 1998, in the name of Stephen J. Brown, titled "Modeling and
13 Scoring Risk Assessment," assigned to the same assignee, attorney docket number
14 HHN-003;

15

16 and

17 o Application Serial No. _____, Express Mail Mailing No. EI027453472US,
18 filed September 23, 1998, in the name of Stephen J. Brown, titled "Reducing Risk
19 Using Behavioral and Financial Rewards," assigned to the same assignee, attorney
20 docket number HHN-004.

21

1 These applications are hereby incorporated by reference as if fully set forth
2 herein.

3

4 *System Elements*

5

6 Figure 1 shows a block diagram of a computer communication system for
7 aggregating and pooling information.

8

9 A system 100 includes a set of client devices 110, a communication path
10 120, a server device 130, and remote workstation 140.

11

12 Client Devices

13

14 The client devices 110 can be identical or can be of differing types. Thus,
15 some client devices 110 can include the first type of client devices 110 as described be-
16 low; some client devices 110 can include the second type of client devices 110 as de-
17 scribed below, or some client devices 110 can include alternative types of client devices
18 110.

19

20 A first type of client device 110 includes a computer 111 (including a proc-
21 essor, memory, and mass storage), a set of web browser software 112, and a modem 113.

1 An embodiment of the first client device 110 is described in detail in the On-Line Bidding
2 Disclosures.

3

4 The first type of client device 110 operates under control of the web
5 browser software 112 and operating software to allow an operator 114 to perform web
6 browsing activity. Known web browser software is available from Netscape Corporation
7 or from Microsoft Corporation. Web browsing activity is described in documentation
8 available from either of those companies.

9

10 The first type of client device 110 uses the modem 113 to send and receive
11 messages using the communication path 120. The communication path 120 is described
12 in further detail below.

13

14 A second type of client device 110 includes a "remote apparatus" such as
15 described in the following patent application:

16

17 o Application Serial No. 08/847,009, filed April 30, 1997, in the name of Stephen J.
18 Brown, titled "Monitoring System for Remotely Querying Individuals," assigned
19 to the same assignee, attorney docket number RYA-126.

20

21 This application is hereby incorporated by reference as if fully set forth
22 herein.

1

2 The second type of client device 110 includes a display 115, an input device
3 116, an input port 117, and a communication interface 118.

4

5 The second type of client device 110 uses the display 115 to inform the op-
6 erator 114 that input information is desired. The operator 114 can comprise a patient, a
7 caregiver for the patient, or some other person. Preferably, the display 115 includes an
8 alphanumeric display capable of displaying a question or request to the operator 114.

9

10 The second type of client device 110 uses the input device 116 to receive an
11 answer to the question or request. For example, if the question asks for the patient's
12 weight that day, the operator 114 uses the input device 116 to input the patient's weight
13 for that day. The input device 116 can include a keypad or keyboard, such as for a com-
14 puter or a television remote control, or can include a more restricted set of keys by which
15 the operator 114 can increment, decrement, or accept a value to be entered for the pa-
16 tient's weight for that day.

17

18 The second type of client device 110 uses the input port 117 to receive data
19 from a measuring device or other device. For example, the display 115 can request that
20 the operator 114 couple the second client device 110 to a medical scale with an electronic
21 readout, and the input port 117 can receive the electronic readout so as to directly receive
22 a signal corresponding to the patient's weight for that day.

1

2 The second type of client device 110 uses the modem 113 similarly to the
3 first type of client device 110, to send and receive messages using the communication
4 path 120.

5

6 In alternative embodiments, the client device 110 may include a wide variety
7 of other devices, possibly including an electronic toy (such as a "game boy" or "virtual
8 pet"), a telephone inter-operating with an interactive voice response system, a television
9 set-top box inter-operating with a cable or satellite television interactive system, a
10 medical device operated at medical personnel office, or any other system by which the
11 operator 114 can enter a value to be used by the system 110 for aggregation and response.

12

13 Communication Path

14

15 The communication path 120 includes a set of electronic communication
16 links for sending and receiving messages between the client devices 110 and the server
17 device 130.

18

19 In a preferred embodiment, the communication path 120 includes the internet,
20 to which the client devices 110 and the server device 130 are coupled. The messages
21 are formatted using a communication protocol for use with the internet, such as TCP/IP,
22 HTML, or a combination thereof. In alternative embodiments, the modem 113 may be

1 replaced by any suitable communication interface, such as a direct communication link
2 (such as a land-line or radio), another type of network link (such as a LAN, WAN, or
3 combination thereof), or using another communication network (such as a private or pub-
4 lic telephone network).

5

6 Server Device

7

8 The server device 130 includes a computer 131 (including a processor,
9 memory, and mass storage), a database 132, and a modem 133. The server device 130 is
10 similar to the "on-line auction company 12" described in detail in the On-Line Bidding
11 Disclosures.

12

13 The server device 130 uses the modem 133 to send and receive messages
14 using the communication path 120.

15

16 The server device 130 uses the database 132 to receive individual values
17 entered by each client device 110, and to identify those individual values with their asso-
18 ciated client device 110. The server device 130 also uses the database 132 to determine
19 statistical measures of the pool of those values in response thereto.

20

1 In a preferred embodiment, the server device 130 operates in a similar man-
2 ner as the "on-line auction company 12" described in detail in the On-Line Bidding Dis-
3 closures

4

5 In a first preferred embodiment, the server device 130 aggregates the indi-
6 vidual values entered by each client device 110. The server device 130 determines an ag-
7 gregate value for the set of individual values, and sends that aggregate value back to each
8 client device 110. Each client device 110 then displays the aggregate value to each indi-
9 vidual operator 114, for use by the operator 114 or by an associated person, such as the
10 patient.

11

12 For example, if the individual values each represent the weight lost by the
13 patient for that day, the server device 130 can aggregate those values to determine a total
14 weight lost by the entire set of patients having client devices 110. The server device 130
15 can then feed back that information to each client device 110 so that each patient can be
16 motivated to contribute to the group effort, even if that individual patient's contribution is
17 relatively minor.

18

19 The aggregate value determined by the server device 130 can be any statis-
20 tical measure or other calculated measure responsive to the set of individual values pro-
21 vided by the set of client devices 110. For example, the aggregate value can be a total (as
22 described with reference to the On-Line Bidding Disclosures), a maximum or minimum

1 value, a median value, a selected centile value, a variance or standard deviation, or some
2 other measure. It is expected that the aggregate value will have meaning to each individ-
3 ual patient associated with a client device 110, even if that individual patient's contribu-
4 tion to that aggregate is relatively minor.

5
6 In a second preferred embodiment, the server device 130 aggregates the in-
7 dividual values entered by each client device 110, but determines the aggregate values
8 with regard to a set of affinity groups with which each individual is associated. As de-
9 scribed in the On-Line Bidding Disclosures, each individual operator 114 at each individ-
10 ual client device 110 can choose to associate themselves with one or more selected affin-
11 ity groups. As described in the On-Line Bidding Disclosures, these affinity groups con-
12 test against each other to obtain the "best" aggregate value. For example, in an on-line
13 auction, the best aggregate value is the highest total bid.

14
15 The server device 130 determines a separate aggregate value for each affin-
16 ity group, and feeds back those separate aggregate values to each client device 110 (or to
17 just those client devices 110 associated with the selected affinity group).

18
19 For example, if the individual values each represent the weight lost by the
20 patient for that day, the server device 130 can determine separate aggregate values for
21 each affinity group, to determine a total weight lost by the entire set of patients in each
22 affinity group. The server device 130 can then feed back that information to each client

1 device 110 so that each patient can be motivated to contribute to their selected affinity
2 group effort, even if that individual patient's contribution is relatively minor.

3

4 The individual values and the separate aggregate values can be selected
5 from a wide variety of possible values, so as to promote individual well being on behalf
6 of each patient, and on the part of each selected affinity group.

7

8 For a first example, the individual values can be the measured height and
9 weight for each patient, and the aggregate value (whether a single aggregate value or a set
10 of separate aggregate values) can be a deviation from ideal weight for the entire affinity
11 group.

12

13 For a second example, the individual values can be monetary contributions
14 to a charitable or other financial cause, and the aggregate value (whether a single aggregate
15 value or a set of separate aggregate values) can be a total monetary contribution.

16

17 For a third example, the individual values can be sales made by field sales-
18 persons for a company or product, and the aggregate value (whether a single aggregate
19 value or a set of separate aggregate values) can be a total amount of sales.

20

21 / / /

1 Remote Workstation

2

3 A remote workstation 140 is coupled to the server device 130, so as to ac-
4 cess information in the database 132 and to receive the aggregate values (whether a single
5 aggregate value or a set of separate aggregate values).

6

7 The remote workstation 140, similar to the first type of client device 110,
8 includes a computer 141 (including a processor, memory, and mass storage), a set of da-
9 tabase software 142 or other display software (such as a set of web browser software),
10 and a modem 143.

11

12 The remote workstation 140 uses the database software 142 or other display
13 software to access the database 132. In accessing the database 132, the remote worksta-
14 tion 140 can receive the aggregate values (whether a single aggregate value or a set of
15 separate aggregate values), or can receive selected sets of individual values from the cli-
16 ent devices 110.

17

18 The remote workstation 140 uses the modem 143 similarly to the way the
19 client device 110 or the server device 110 use their respective modems.

20

21 An operator 144 at the remote workstation 140 can use the database soft-
22 ware 142 or other display software to add a broadcast message to the database 132. The

1 server device 130, when feeding back the aggregate value, sends the broadcast message to
2 the client devices 110.

3

4 The broadcast message can be a congratulatory message relating to the re-
5 sultant aggregate value, an exhortatory or inspirational message for the one or more se-
6 lected affinity groups, or a commercial or political message to one or more selected affin-
7 ity groups.

8

9 For a first example, if the resultant aggregate value indicates that a weigh-
10 loss club has collectively lost 10,000 pounds of weight in one day, and this is a new rec-
11 ord, the broadcast message can indicate the new record and congratulate all patients, even
12 those whose contribution was relatively minor.

13

14 For a second example, the broadcast message can be a daily inspirational
15 message for an affinity group, selected by the operator 144 at the remote workstation 140.

16

17 For a third example, the broadcast message can be a prize announcement (or
18 an announcement of another benefit) to the individual patient who contributes most to the
19 aggregate value. Similarly, when there are multiple affinity groups, the broadcast mes-
20 sage can announce a prize or other benefit to the team with the best result.

21

22 / / /

1 *Method of Operation*

2

3 Figure 2 shows a process flow diagram of a method for aggregating and
4 pooling information in a computer communication system.

5

6 A method 200 includes a set of flow points to be reached, and steps to be
7 performed, by elements of the system 100, including the client devices 110, the server de-
8 vice 130, and the remote workstation 140.

9

10 Client/Server Feedback

11

12 At a flow point 210, the system 100 is ready to receive individual values
13 from client devices 110.

14

15 At a step 211, client devices 110 receive individual values from their asso-
16 ciated operators 114. As noted above, each client device 110 can receive an individual
17 value in response to a question-and-answer session, or can receive an individual value in
18 response to a coupled data-collection device.

19

20 At a step 212, client devices 110 send their individual values to the server
21 device 130. Operators at each client device 110 can select an affinity group in response
22 to a menu of affinity groups presented by the server device 130.

1

2

3

At a step 213, the server device 130 receives the individual values and records them in the database 132.

4

5

6

7

At a step 214, the server device 130 determines one or more aggregate values (either a single aggregate value or a set of separate aggregate values) in response to the set of individual values.

8

9

10

At a step 215, the server device 130 feeds back the one or more aggregate values to the client devices 110.

11

12

13

At a step 216, the client devices 110 display the fed back aggregate values to their associated operators 114.

14

15

16

17

The method 200 thereafter proceeds with the flow point 210 again, such as a next day. For example, the method 200 can be selected to operate at a same or similar time each day.

18

19

Client/Workstation Feedback

20

21

22

At a flow point 220, the remote workstation 140 is ready to receive individual values or aggregate values from the server device 130.

1

2 At a step 221, the remote workstation 140 receives individual values or ag-
3 gregate values from the server device 130.

4

5 At a step 222, the operator 144 at the remote workstation 140 examines the
6 received individual values or aggregate values.

7

8 At a step 223, the operator 144 at the remote workstation 140 enters a
9 broadcast message to be sent to client devices 110.

10

11 At a step 224, the remote workstation 140 sends the broadcast message to
12 the server device 130.

13

14 At a step 225, the server device 130 sends the broadcast message to selected
15 client devices 110 (or to all of them).

16

17 The method thereafter proceeds with the flow point 220 again, such as a
18 next day. For example, the method 200 can be selected to operate at a same or similar
19 time each day.

20

1 *Alternative Embodiments*

2

3 Although preferred embodiments are disclosed herein, many variations are
4 possible which remain within the concept, scope, and spirit of the invention, and these
5 variations would become clear to those skilled in the art after perusal of this application.

Claims

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1. A method of aggregating information for individuals in a population

thereof, said method including steps for

collecting information for each individual at a client device associated with

said individual;

sending said information from said client device to a server device;

determining statistical information with regard to said information collected

from a plurality of said client devices; and

distributing said statistical information to said individuals.

2. A method as in claim 1, wherein said steps for collecting information

include steps for

coupling said client device to a data collection element for said individual:

and

collecting said information from said data collection element.

3. A method as in claim 1, wherein said steps for collecting information

include steps for

prompting said individual, at said client device, for said information; and

collecting said information from said individual in response to said steps for

prompting.

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4. A method as in claim 1, wherein said steps for determining statistical

information include steps for

determining a first statistical measure for a first sub-population of said indi-

viduals; and

determining a second statistical measure for a second sub-population of said

individuals.

5. A method as in claim 1, wherein

said steps for determining statistical information include steps for (1) de-

termining a first statistical measure for a first sub-population of said individuals, and (2)

determining a second statistical measure for a second sub-population of said individuals;

and

said steps for distributing include steps for distributing both said first statis-

tical measure and said second statistical measure.

6. A method as in claim 1, wherein

said steps for determining statistical information include steps for (1) de-

termining a first statistical measure for a first sub-population of said individuals, and (2)

determining a second statistical measure for a second sub-population of said individuals;

and

1 said steps for distributing include steps for (1) comparing said first statisti-
2 cal measure and said second statistical measure, and (2) distributing a result of said steps
3 for comparing.

4

5 7. A method as in claim 1, wherein

6 said steps for determining statistical information include steps for (1) de-
7 termining a first statistical measure for a first sub-population of said individuals, and (2)
8 determining a second statistical measure for a second sub-population of said individuals;
9 and

10 said steps for distributing include steps for (1) comparing said first statisti-
11 cal measure and said second statistical measure, and (2) awarding a benefit in response to
12 a result of said steps for comparing.

13

14 8. A method as in claim 1, wherein said steps for distributing include
15 broadcast communication.

16

17 9. A method as in claim 1, wherein said steps for distributing include
18 sending said statistical information from said server device to at least one said client de-
19 vice.

20

21 10. A method including steps for

1 entering, at each one of a set of client devices, a value associated with said
2 client device;
3 sending, for each one of said client devices, said value to a server device;
4 determining, at said server device, an aggregate value in response to said
5 values;
6 sending, from said server device to said client devices, said aggregate value;
7 and
8 displaying, at said client devices, said aggregate value.

9
10 11. A system for aggregating information for individuals in a population
11 thereof, said system including
12 a set of client devices, each disposed for collecting an individual value for
13 an individual associated therewith;
14 a server device, disposed for receiving said individual values, and for de-
15 termining at least one aggregate value in response thereto;
16 a communication path between said client devices and said server device;
17 wherein said server device distributes said at least one aggregate value to a
18 plurality of said client devices.

19
20 12. A system as in claim 11, wherein at least one said client device in-
21 cludes a data collection element disposed for measuring said individual value for said in-
22 dividual.

1

2 13. A system as in claim 11, wherein at least one said client device in-
3 cludes

4 a display element, said display element capable of prompting said individ-
5 ual, at said client device, for said individual value; and

6 an input element, said input element disposed for collecting said individual
7 value in response to said display element.

8

9 14. A system as in claim 11, wherein said at least one aggregate value
10 includes

11 a first aggregate value for a first affinity group of said individuals; and

12 a second aggregate value for a second affinity group of said individuals.

13

14 15. A system as in claim 11, wherein said communication path includes
15 broadcast communication.

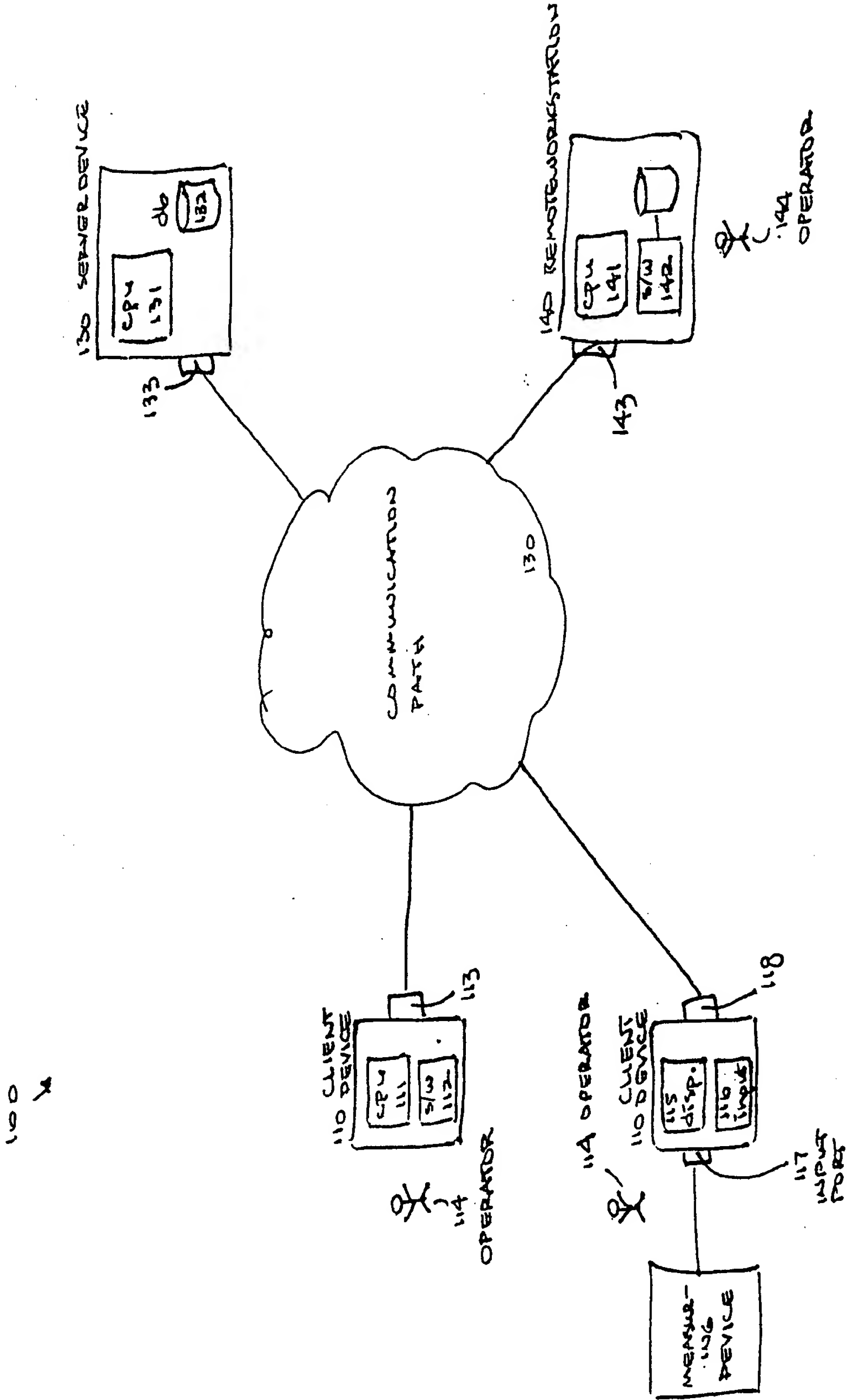


FIGURE 1

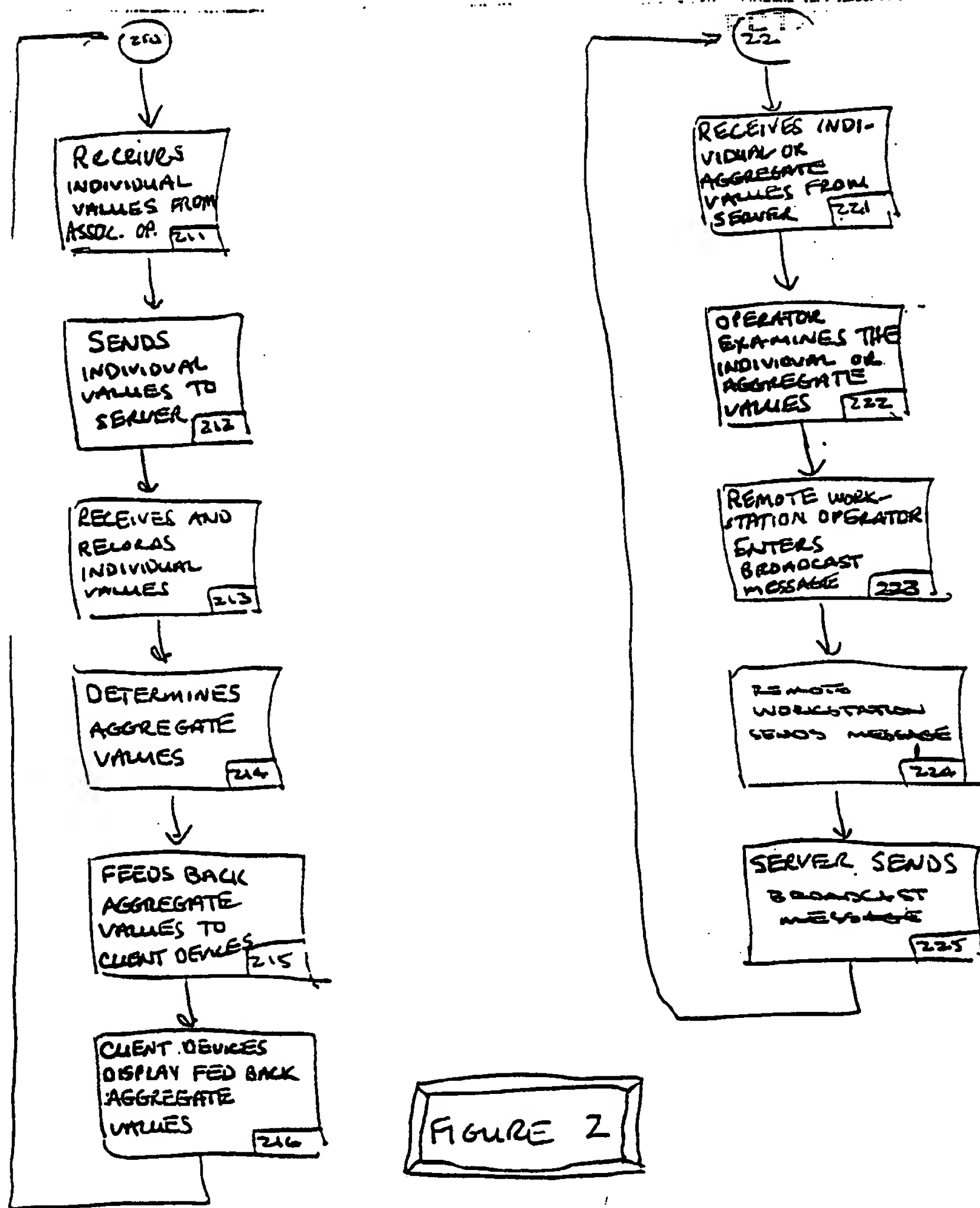


FIGURE 2

CLIENT/SERVER FEEDBACKCLIENT/WORKSTATION FEEDBACK

INTERNATIONAL SEARCH REPORT

Intern al Application No

PCT/US 99/22017

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 703 540 A (SUN MICROSYSTEMS, INC.) 27 March 1996 (1996-03-27) the whole document ---	1-15
X	WO 96 08779 A (DOLPHIN SOFTWARE PTY. LTD.) 21 March 1996 (1996-03-21) the whole document ---	1-15
A	PITKOW ET AL: "RESULTS FROM THE FIRST WORLD-WIDE WEB USER SURVEY" JOURNAL OF COMPUTER NETWORKS AND ISDN SYSTEMS (SPECIAL ISSUE), vol. 27, no. 2, 25 May 1994 (1994-05-25), pages 1-15, XP002073755 the whole document --- -/--	1-15

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

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- "&" document member of the same patent family

Date of the actual completion of the international search

10 January 2000

Date of mailing of the international search report

19/01/2000

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INTERNATIONAL SEARCH REPORT

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PCT/US 99/22017

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PITKOW ET AL: "Using the Web as a survey tool: results from the second WWW user survey"</p> <p>COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 27, 1995, pages 809-822, XP004013183 the whole document</p> <p style="text-align: center;">---</p>	1-15
A	<p>PATENT ABSTRACTS OF JAPAN</p> <p>vol. 17, no. 255 (P-1539), 20 May 1993 (1993-05-20)</p> <p>& JP 04 372080 A (MATSUSHITA ELECTRIC IND CO LTD), 25 December 1992 (1992-12-25) abstract</p> <p style="text-align: center;">-----</p>	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/22017

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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			US 5893098 A	06-04-1999
JP 04372080	A	25-12-1992	NONE	